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REPORT AND RECOMMENDATION OF THE PRESIDENT

TO THE EXECUTIVE BOARD ON PROPOSED

TECHNICAL ASSISTANCE GRANTS

FOR

AGRICULTURAL RESEARCH AND TRAINING

BY

CGIAR-SUPPORTED INTERNATIONAL CENTRES



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ABBREVIATIONS AND ACRONYMS

AFESD	Arab Fund for Economic and Social Development
CIAT	International Centre for Tropical Agriculture
CIP	International Potato Centre
DARPO	Department of Agricultural Research and Product Quality
NAFRI	National Agriculture and Forestry Research Institute
NTFP	Non-Timber Forest Product
FAO	Food and Agriculture Organization of the United Nations
GIS	Geographical Information Systems
IARC	International Agricultural Research Centre
ICARDA	International Centre for Agricultural Research in the Dry Areas
ILRI	International Livestock Research Institute
IsDB	Islamic Development Bank
M&M	Mashreq and Maghreb
NARS	National Agriculture Research Systems
NENA	Near East and North Africa
PY	Programme Year
RADISCON	Regional Animal Disease Surveillance and Control Network
TAG	Technical Assistance Grant



**REPORT AND RECOMMENDATION OF THE PRESIDENT OF IFAD
TO THE EXECUTIVE BOARD ON PROPOSED TECHNICAL ASSISTANCE GRANTS
FOR
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I submit the following Report and Recommendation on two proposed technical assistance grants (TAGs) for agricultural research and training to CGIAR-supported international centres in the amount of USD 2 550 000.

PART I - INTRODUCTION

1. This report recommends the provision of IFAD support to the research and training programmes of two CGIAR-supported international centres: the International Centre for Tropical Agriculture (CIAT) and the International Livestock Research Institute (ILRI).
2. The documents of the TAGs for approval by the Executive Board are contained in the annexes to this report:
 - I. International Centre for Tropical Agriculture (CIAT): Programme for Integrated Upland Agriculture Development Using Participatory Approaches in China, Laos and Viet Nam
 - II. International Livestock Research Institute (ILRI): Programme for Small-Ruminant Health – Improved Livelihood and Market Opportunities for Poor Farmers in the Near East and North Africa Region
3. The objectives and content of these applied research programmes are in line with the evolving strategic objectives of IFAD, and the policy and criteria of its TAG programme for agricultural research and training.
4. The strategic objectives of IFAD's support for technology development relate to: (i) IFAD's target groups and their household food-security strategies, specifically in remote and marginalized agroecological areas; (ii) technologies that build on traditional knowledge systems, are gender-responsive, and enhance and diversify the productive potential of resource-poor farming systems by improving productivity and addressing production bottlenecks; (iii) access to productive assets (land and water, financial services, labour and technology, including indigenous technology) and sustainable and productive management of such resources; (iv) a policy framework that provides the rural poor with an incentive to reach higher levels of productivity, thereby reducing their dependence on transfers; and (v) an institutional framework within which formal and informal, public and private-sector, local and national institutions provide services to the economically vulnerable, according to their comparative advantage. Within this framework, IFAD also intends to develop commodity-based approaches to rural poverty alleviation, specifically targeting those items that are produced and consumed by the rural poor. Finally, the establishment of a consolidated network for knowledge-gathering and dissemination will enhance the Fund's capacity to establish long-term strategic linkages with its development partners and to multiply the effect of its agricultural research and training programme.



5. The TAGs proposed in this document respond to the foregoing strategic objectives. The Programme for Integrated Upland Agriculture Development Using Participatory Approaches in China, Laos and Viet Nam responds to objectives (i), (ii), (iii) and (v). The programme will seek to introduce technical and institutional innovations in the context of indigenous and marginalized communities residing in upland areas of East Asia. It will be directly linked to IFAD's new or ongoing loan projects, which will enable IFAD target groups to be involved in the adaptation and verification of technological alternatives to shifting cultivation, in situations where these were found unsustainable. The programme will develop institutional capacity to support the development and diffusion of technologies building on indigenous knowledge and practices in improved land management. The Programme for Small-Ruminant Health – Improved Livelihood and Market Opportunities for Poor Farmers in the Near East and North Africa Region responds to objectives (iii), (iv) and (v). It will seek to provide access to market information for poor small-ruminant farmers; it will support a policy framework that will provide the rural poor with incentives to improve productivity, thereby reducing their dependence on subsidies; and, with a view to having a direct impact on small and low-income producers, it will seek to develop an appropriate institutional framework for provision of services to the economically vulnerable. It is proposed to achieve these objectives through support to regional, national and local capacity for disease diagnosis and control strategies; training for developing human resource capacity in diagnosis of small-ruminant diseases; provision of equipment/reagents for priority small-ruminant diseases in the region (both for central and mobile units). Finally, the proposal is in tune with the objective of establishing consolidated networks for knowledge-gathering and dissemination among national diagnostic laboratories in the subregion for quality assurance and standardization of diagnostic tests.

PART II - RECOMMENDATION

6. I recommend that the Executive Board approve the proposed technical assistance grants in terms of the following resolution:

RESOLVED: that the Fund, in order to finance, in part, the Programme for Integrated Upland Agriculture Development Using Participatory Approaches in China, Laos and Viet Nam shall make a grant not exceeding one million four hundred and fifty thousand United States dollars (USD 1 450 000) to the International Centre for Tropical Agriculture (CIAT) upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented to the Executive Board in this Report and Recommendation of the President.

RESOLVED FURTHER: that the Fund, in order to finance, in part, the Programme for Small-Ruminant Health – Improved Livelihood and Market Opportunities for Poor Farmers in the Near East and North Africa Region shall make a grant not exceeding one million one hundred thousand United States dollars (USD 1 100 000) to the International Livestock Research Institute (ILRI) upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented to the Executive Board in this Report and Recommendation of the President.

Lennart Båge
President



**INTERNATIONAL CENTRE FOR TROPICAL AGRICULTURE (CIAT):
PROGRAMME FOR INTEGRATED UPLAND AGRICULTURE DEVELOPMENT
USING PARTICIPATORY APPROACHES IN CHINA, LAOS AND VIET NAM**

I. BACKGROUND

1. Poverty in Asia remains greatest in the steep upland areas as in the case of the mountainous areas of southern China, north and north-east Laos and Viet Nam. Farmers in these areas still practise shifting cultivation, which can lead to degradation of soil, water and forest resources. Government attempts to discourage the practice have adversely affected traditional livelihood systems leading to food insecurity and socio-cultural dislocation. Before influencing traditional livelihood strategies, governments need to ensure that viable and sustainable alternatives are available – especially strategies that increase labour productivity both for subsistence and income-generating agricultural activities.

2. Through its investment programme, IFAD continues to address the problem of rural poverty using a multi-sectoral approach: improving local infrastructure and social services, as well as agriculture production. The proposed technical assistance programme will strengthen the institutional arrangements to ensure that there is a demand-driven approach in improving agricultural production, building on indigenous practices and introducing new scientific developments. The programme will provide for the evaluation of emerging technologies from the International Centre for Tropical Agriculture (CIAT), the International Potato Centre (CIP) and other international agricultural research centres (IARCs). It will also ensure the rapid dissemination of the more promising candidate technologies to associated IFAD projects in the mountainous regions of the participating countries and their neighbours.

II. RATIONALE/RELEVANCE TO IFAD

3. The terrain and natural hazards of the steep uplands make them inaccessible, and they lack infrastructure and health and education services. Awareness of and access to external markets is often limited resulting in unfavourable terms of trade. The multi-ethnic communities residing there, frequently including indigenous groups, are often politically and economically marginalized compared with people in surrounding lowland areas and regional centres of power.

4. Because of their isolation, these rural communities rely largely on subsistence forms of livelihood based on shifting agriculture and the use of non-timber forest products (NTFPs). These systems exploit the area's natural diversity and are sustainable under low population density. However, with population increases coupled with land-allocation programmes that have restricted access, the fragile systems are unable to cope, resulting in declining soil fertility and a consequent reduction in crop yields. There are compelling arguments for moving from shifting agricultural systems to more sedentary forms of land use with a stronger focus on crop diversification and a market economy. Increased income will allow greater access to the health and education services that are now being implemented. Thus assistance needs to focus on creating new assets, e.g. increased knowledge, strengthened local leadership, and equitable access to credit, land and markets, as well as increased production and cash income from new or improved local technologies.

5. Because of the need to take account of social, cultural and economic differences, which vary within and among ethnic groups, a participatory approach with flexibility in programme objectives and priorities will be used. This includes consulting the poor on their perceptions of the causes for their poverty and possible solutions. Poor communities in the uplands of Laos already recognize many



of the primary causes of poverty, including shortened fallow periods, declining soil fertility, livestock disease, lack of cash crops and knowledge of markets, lack of technical knowledge and skills, lack of cash savings for investment, and weak local leadership. Among suggested remedies are improved extension advice on livestock, cash crops, fish, marketing and NTFPs; a more realistic allocation of land; veterinary services; development of small livestock systems; credit; road improvement; and improved water supplies.

6. It is clear that the varied needs of the poor can only be met through a multisectoral approach. Recent formulation and appraisal missions have suggested **opportunities and areas for intervention** in the agricultural sector, with the proviso that programme-supported activities will respond to farmer demands expressed during the participatory planning process. Anticipated activities include:

China: West Guangxi Poverty-Alleviation Project

- introducing improved varieties of maize;
- developing new cash crops such as cassava, sorghum, beans and potatoes;
- increasing cash income from livestock;
- improving management of organic manure and increasing efficiency of fertilizer use;
- introducing erosion barriers to reduce soil erosion;
- carrying out more widespread on-farm trials and demonstrations;
- training farmers in improved husbandry practices for crops and livestock; and
- improving use of natural fodder and introducing improved fodder.

Laos: Oudomxai Community Initiatives Support Project (Bokeo and Oudomxai)

- carrying out on-farm trials of more permanent agricultural systems;
- conducting participatory testing of technologies of improved cultural practices;
- supplying seeds and planting materials of improved varieties for non-rice crops;
- vaccinating livestock and improving husbandry;
- developing fish ponds;
- cultivating NTFPs and firewood trees; and
- creating market awareness and developing linkages with the private sector.

Viet Nam: Rural Income Diversification Project in Tuyen Quang Province

- evaluating indigenous and new varieties of crops for upland farming;
- carrying out demonstrations of new cropping patterns and low-input technologies;
- reducing post-harvest losses in rice, maize, cassava and other crops;
- evaluating labour-saving technologies, particularly for tasks carried out by women;
- integrating livestock and crop production systems;
- developing fodder systems on land released to communities;
- strengthening village communities to lead their own development; and
- promoting microenterprise development.

7. CIAT and CIP have improved varieties and production systems for beans, cassava, potatoes, sweet potatoes and fodder varieties ready to be evaluated. The adoption of these potential technologies, developed in collaboration with national partners in the region, will lead to rapid increases in production and cash income. Improved forage systems have been developed for different soil, climate and farming systems. Many of the adapted grasses and legumes are multi-purpose and can be used for soil improvement, erosion barriers and firewood as well as animal feed. More-productive and sustainable cropping systems based on improved varieties, efficient fertilization,



intercropping and erosion barriers have been developed for cassava-based systems. Low-cost methods for multiplying disease-free seed and planting material have increased crop yields by 20-30%. Low-cost fermentation methods have been shown to improve feed-to-meat conversion efficiency of sweet potato roots and foliage. Small-scale processing machinery for producing sweet potato noodles increased cash income for farmers. Smallholder households in north Viet Nam have doubled their income by processing starch from cassava.

8. The programme will also identify, test and introduce technologies developed by other CGIAR centres and IARCs in conjunction with the national agriculture research systems (NARS) of each participating country. Priority will be given to meeting specific needs expressed by the rural communities and evaluating interventions that overcome bottlenecks in the farming system and produce quick results. Both CIAT and CIP have experience of working in a systems context in Asia: CIAT through integrated agricultural development projects in Laos and Viet Nam, and CIP through the Users Perspective with Agricultural Research and Development (UPWARD) Network, which is introducing participatory approaches to integrated crop management. In an upland community in central Viet Nam, in a collaborative CIAT-University of Hue project, impact was achieved within three years by increasing rice yields and cash flow from improved pig and fish systems. This improved feed supplies from cassava and legumes contributing to feed supplies for pigs and fish. In a forage and livestock systems project in Laos, additional input on overcoming animal health problems is providing an entry point for improved feed systems and management practices.

9. In addition to introducing new technologies, the programme will take into account the adaptive strategies already developed by different cultural groups. Such knowledge, developed over generations, can make a significant contribution to productive and sustainable development. Natural biodiversity in wild and domestic crops and forest products can be captured and incorporated with scientific outputs to develop integrated production and resource management systems. Ability to improve the commercialization of NTFPs has been demonstrated in Laos through a World Conservation Union (IUCN) project working with the National Agriculture and Forestry Research Institute (NAFRI), IFAD's Lao partner.

10. There is a need to identify market opportunities and create market awareness for both indigenous and new technologies. Long-term trends rather than short-term fashions will be used to assess opportunities and options. The move from shifting agriculture to a sedentary farming system involves a high degree of risk. It is therefore essential to pace development with the farmers' ability to handle risk. The programme will aim to work towards development of enterprises that add value through post-harvest processing and marketing, which will provide the capital input needed to allow a change from shifting agriculture to a sedentary farming system.

11. Greater use of participatory approaches, which target the needs of marginalized groups and rural women, will allow the programme to capture indigenous knowledge while introducing new information, concepts and technologies. Hence attention also needs to be given to (i) increasing leadership capacity in marginal rural communities to enable them to shape their own development; (ii) expanding opportunities for women to take part in the development process; and (iii) institutionalizing a process-oriented approach within national organizations. The success of participatory development depends on the adoption of a 'learning culture' in both the rural communities and the development organizations interacting with them.

12. Close linkages with IFAD projects will facilitate diffusion of improved varieties and more-productive enterprises. Programme sites will be located in IFAD project areas, making it relatively easy to target technical assistance and training to IFAD projects.



III. THE PROPOSED PROGRAMME

13. The strategic **goal** is to improve livelihood systems of resource-poor farmers in steep upland areas of China, Laos and Viet Nam through technical and institutional innovations as a contribution to reducing poverty in indigenous and marginalized rural communities.

14. The immediate **objectives** are to: (i) introduce emerging technologies that increase food supply and income, and provide alternatives to shifting agriculture; (ii) increase the capacity of rural communities to manage their own development; (iii) increase the capacity of government services to provide a sustained input into agricultural development; (iv) develop approaches that complement indigenous knowledge and practices with new knowledge and ideas for increasing productivity and improving land management; and (v) provide support to government personnel working in association with IFAD loan projects.

15. Key programme activities will include a common set of activities to be conducted at all sites, and additional specific activities to be developed for each site. Appropriate technology interventions by each project will be:

China

- development of new cash crops such as cassava, sorghum, beans and potatoes;
- increases in cash income from livestock;
- improvements in management of organic manure and fertilizer input;
- introduction of erosion barriers to reduce soil erosion;
- more-widespread on-farm trials and demonstrations;
- greater use of natural and improved fodder; and
- training of district officers at all sites.

Laos

- crops for feeding small livestock (e.g. cassava, sweet potatoes and legumes);
- integrated crop management practices for lowland rice cultivation;
- introduction of vegetable and fruits for consumption and sale;
- improved management practices for pig raising and fish;
- extension of paper mulberry as a fallow and cash crop for its fibre;
- introduction of legumes into the fallow; and
- agroenterprise development of NTFPs (input with NAFRI).

Viet Nam

- evaluation of new varieties (e.g. beans, cassava, potatoes, maize and groundnuts);
- fodder systems for new areas of land allocated to the community;
- evaluation of labour-saving for tasks carried out by women;
- integration of livestock and crop production systems;
- evaluation of fodder trees, grasses, legumes and root crops for cattle and pigs;
- post-harvest handling of market crops; and
- microenterprise development.



IV. EXPECTED OUTPUTS/EXPECTED BENEFITS

16. The expected **outputs** are:

- appropriate technology interventions that improve the livelihoods of the rural poor;
- strengthened community leadership and organizational capacity;
- increased capacity at different government levels to implement participatory technology development;
- more-effective approaches to evaluate, improve and disseminate appropriate technologies that integrate local and new knowledge; and
- improved communication linkages among organizations working on integrated agricultural development.

V. IMPLEMENTATION ARRANGEMENTS

17. CIAT will be the implementing agency and will be responsible for reporting progress to the donor. Its regional office in Vientiane, Laos, will manage the programme. The CIAT-CIP partnership will interact with participating national organizations at each IFAD-funded project site. A steering committee with IFAD representatives will meet annually to guide the programme through implementation and ensure that programme needs are mainstreamed in the annual workplans.

18. **Sites.** On-farm trial sites will be selected in IFAD project areas in consultation with the programme management unit and participating farmers; e.g. in China, Guangxi; in Laos, Oudomxai and Xieng Khouang; and in Viet Nam, Ha Giang/Quang Binh and Tuyen Quang. Sites (commune, village cluster, micro-watershed) will be chosen on the basis of accessibility and suitability as focal sites for training and dissemination. The final decision on sites will be made at a start-up stakeholders' workshop and after visits to IFAD project sites.

19. Counterpart agencies will be:

- **China:** Institute for Subtropical Crops, Nanning, Guangxi Province; and county and town officers at project sites.
- **Laos:** Provincial and district agriculture offices in Oudomxai and Xieng Khouang; and NAFRI.
- **Viet Nam:** Department of Agricultural Research and Product Quality (DARPQ), Ministry of Agriculture and Rural Development, provincial agricultural and rural development offices in Ha Giang/Quang Binh, Tuyen Quang and Hanoi.

20. Collaborating organizations will be requested to assign a field officer for each site. Involving national agencies in Laos and Viet Nam will facilitate access to candidate technologies developed by national and other organizations and build in sustainability. NAFRI coordinates eight research institutes in areas of agriculture, livestock and forestry. DARPQ coordinates 34 agricultural institutes. The programme design was discussed with the director-general of NAFRI and the director of DARPQ, who have given their assurances of support for the programme. Similarly, the Institute for Subtropical Crops has assured collaboration. CIAT already has collaborative arrangements in place at the national levels in Laos and Viet Nam, and with provinces in Guangxi (China), Xieng Khouang (Laos) and Tuyen Quang (Viet Nam).

21. Monitoring and evaluation has been built into the programme design. IFAD will receive semi-annual progress reports, annual financial statements and an audit report.

**VI. INDICATIVE PROGRAMME COSTS AND FINANCING**

22. A financing plan for the proposed four-year programme is reflected in the table below. The proposed IFAD grant amount is USD 1.45 million.

COSTS AND FINANCING
(USD '000)

Cost Category	IFAD	CIAT, CIP Matching Resources* 'In-Kind'	Total
Staff cost	440	375	815
Technical assistance support	150	70	220
Action research through collaborating NARS	420	150	570
Training and workshops NARS	220	80	300
Overhead (18%)	220	-	220
Total	1 450	675	2 125

* Additional resources 'in-kind' are expected from the IFAD projects, e.g. staff, trainers, facilities and transportation.



**INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE (ILRI)
PROGRAMME FOR SMALL-RUMINANT HEALTH – IMPROVED LIVELIHOOD
AND MARKET OPPORTUNITIES FOR POOR FARMERS IN THE NEAR EAST
AND NORTH AFRICA REGION**

I. BACKGROUND

Problem Definition and Programme Development

1. Urbanization and the change in dietary habits and lifestyle in the Near East and North Africa (NENA) region have significantly increased the demand for meat and milk, and caused a dramatic shift from extensive traditional systems to more-intensive mixed crop/small-ruminant or small-ruminant fattening systems. These shifts in production have resulted in greater pressure on poor farmers' resource bases and more competition for veterinary, marketing and other services with more market-oriented medium-to-large-scale livestock entrepreneurs. In addition, high costs and poor market information limit the ability of poor farmers to negotiate reasonable prices relative to prices in the final central or export market. Despite these constraints, there is great potential for involving poor small-ruminant farmers in local, national and regional livestock markets. At present, the sheep population predominates in all countries of the region (256.7 million sheep, compared with 144.5 million goats and 80.7 million cattle). Sheep and goat production is regarded as a regional priority for agriculture development because most producers (including women) in NENA countries belong to the poorest strata of the region's population, and low productivity limits food security of low-income urban households. Disease is a major constraint to productivity and trade, which severely affects the livelihoods and development prospects of smallholders and mobile herders.

2. This proposal results from key recommendations coming out of (i) the meeting of the IFAD-funded Mashreq and Maghreb (M&M) project, attended by representatives from 17 NARS in the region, to identify priorities for the livestock sector in NENA; and (ii) the Food and Agriculture Organization of the United Nations (FAO) Emergency Prevention System for Transboundary Diseases (EMPRES) Expert Consultation.

3. From the policy perspective, this programme takes into account the rapid changes in the agroecological, socio-political and socio-economic environment in the NENA region. Some of these changes have a direct impact on the strategy for supporting agricultural and rural development, particularly for small and low-income producers.

II. RATIONALE/RELEVANCE TO IFAD

4. The aim of the programme is to improve poor farmers' livelihoods through improved small-ruminant health and production. There are several trends in the NENA region that motivate this programme. Despite economic growth in the region and increasing opportunities for livestock trade, poor farmers are unable to capture the benefits. Droughts, reduced pastures, diminished animal health and production services, and high transaction costs and other market-efficiency and access barriers prevent poor farmers from enhancing their food security and increasing their incomes.

5. A number of promising initiatives provide opportunities and mechanisms for improving livelihoods for poor farmers through small-ruminant health. One is the IFAD-funded M&M project, which uses community-based development methodologies. However, the project lacks a small-ruminant health component, and hence the activities of this proposal will add value and can be integrated into the existing M&M project sites. A second initiative that can be built upon is the FAO-

coordinated, IFAD-funded Regional Animal Disease Surveillance and Control Network (RADISCON) project, which provides common methods and standards for disease information in the region. An understanding of the epidemiology of disease under different production systems and prevailing conditions is a critical first step to recommending disease-control strategies and assessing risk. Next, an analysis of the relative merits of different control options in terms of optimal efficacy and impact is required. Such information can help both to target and to refine disease-control interventions. For maximum adoption of control strategies, research is required to identify the emerging uptake pathways (e.g. mix of public-private and community groups) most suited to delivering the control programme and specific technologies for each production system.

III. THE PROPOSED PROGRAMME

6. Three complementary and linked research pathways are envisaged to generate results that will improve livelihoods for poor farmers. These are (i) better understanding of the constraints for improving the delivery and adoption of animal health services at local level to decrease small-ruminant mortality; (ii) research into best-bet animal health and production opportunities and how these can be delivered and adopted to support development efforts to increase small-ruminant productivity; and (iii) research to support better disease-control decisions and enhance market efficiency at sub-national, national and regional levels leading to developments that will enhance market opportunities for poor farmers. A multi-level research approach will be adopted to achieve these linked research objectives.

7. At local level, the programme will target farm- and community-level studies in production systems where small ruminants are crucial to the livelihoods of the poor. Both biophysical and socio-economic studies will investigate major constraints to small-ruminant productivity at household level in order to identify the key services required to relieve these constraints and how they can be delivered.

IV. EXPECTED OUTPUTS/EXPECTED BENEFITS

8. Proposed research activities, based on this strategy, are organized to fulfil the four specific research objectives.

- (i) **Analysis of the main health constraints of small ruminants and of the delivery of animal health and other essential services in communities within target small-ruminant farming systems leading to identification of ‘best-bet’ strategies.**

Research activities will include:

- rapid household and community-level studies using participatory approaches, including social mapping;
- development of community action plans for priority constraints and potential opportunities;
- characterization and analysis of delivery systems and market access; and
- identification and pilot-testing of strategies (e.g. animal health, feeding, breeds, finance and credit, market levies and services) to improve delivery of services and market access to poor farmers.



Outputs and milestones will be:

- participatory action plans developed (second programme year (PY) and implemented (PY 4 and 5);
- reports on characterization (PY 2) and analysis of delivery systems and market access (PY 3); and
- pilot best-bet strategies developed (PY 3) and initial experiences assessed/reported (end of PY 5).

- (ii) **Assessment of risk and development of disease-control strategies at sub-national, national and regional levels.** This will be achieved through epidemiological and socio-economic analyses to ensure and enhance market access for poor small-ruminant farmers.

Research activities will include:

- collate RADISCON data with geographical information systems (GIS) data for descriptive analyses of disease risk under different ecological and production systems;
- assess available disease information and design field studies to fill important information gaps;
- develop mathematical models for transmission of priority small-ruminant diseases and evaluate impacts of current control programmes using parameters specific to production systems;
- revise initial disease models as required and make predictions of potential control strategies;
- incorporate disease model outputs into economic models to evaluate potential benefits relative to costs of different control strategies; and
- integrate epidemiological and economic models into decision-support services for national and regional veterinary departments.

Outputs and milestones will be:

- initial disease-risk maps produced with available data and disease information gaps identified (PY 2);
- mathematical models for three or four of the highest-priority small-ruminant diseases developed (PY 2) and used to assess current control programmes (PY 3);
- additional disease surveys designed and integrated into disease-risk maps and databases (PY 3-4);
- initial report of epidemiological and economic impact of priority small-ruminant disease completed (PY 3-4), and refined and updated with additional information (PY 5); and
- initial decision-support tools (risk assessment, early warning systems, disease prioritization) developed for national and regional technical staff and policy-makers (PY 5).

- (iii) **Support to regional, national and local capacity for disease diagnosis and control strategies.**

Research activities will include:

- evaluate diagnostic capacity and needs assessment – national partners, FAO (linked to RADISCON project) and ILRI in each sub-region;
- provide training for developing human resource capacity in diagnosis of small-ruminant diseases;

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- provide equipment/reagents for priority small-ruminant diseases in the region (both for central and mobile units); and
- develop networks among national diagnostic laboratories in the sub-region for quality assurance and standardization of diagnostic tests.

Outputs and milestones will be:

- workshops and assessments on diagnostic capacity and needs assessment (PY 1 and 2);
- training courses conducted (PY 3, 4 and 5);
- equipment and reagents for priority disease diagnosis supplied and used (PY 3, 4 and 5); and
- establishment of sub-regional diagnostic networks (PY 3 in the Near East and between Somalia and The Sudan and importing countries, and PY 4 and 5 in Maghreb and development of a potential network in the Horn of Africa in collaboration with the Organization of African Unity/Inter-African Bureau for Animal Resources.

- (iv) **Assessment of markets to improve information, efficiency and access for poor farmers.** Livestock trade and markets are both important and rapidly changing in the region. Most countries are net importers, either of small ruminants, meat or feeds. The Sudan and other countries in the Horn of Africa are net exporters and could greatly enhance their exports.

Research activities will include:

- development of a framework and criteria for market assessment at local, national and regional levels (accessibility to different classes of markets, relative local and export prices, transaction costs, etc.);
- capacity-building and training for market assessment within the marketing nucleus, Planning and Economics Department of the Ministry of Animal Resources, The Sudan;
- study on efficiency of livestock markets from local to export (Egypt, Libyan Arab Jamahiriya and Saudi Arabia) in Somalia and The Sudan;
- study on cross-border trade in the Near East sub-region (Iraq, Jordan, Lebanon, Saudi Arabia, Syria and Turkey); and
- assessment of potential benefits to the poor and women of animal health and other market-enhancing strategies.

Outputs and milestones will be:

- framework and criteria for market-assessment studies developed (PY 1 and 2);
- training for staff in market nucleus (PY 1 and 2);
- PhD study on efficiency of and constraints to livestock markets in The Sudan (PY 3 and 4);
- regional study of livestock markets in the Near East (PY 2 and 3); and
- report on assessment of pro-poor benefits of different market strategies (PY 5).

V. IMPLEMENTATION ARRANGEMENTS

9. ILRI will implement the programme. It has overall responsibility for facilitating the participation of all partners and ensuring the completion of all activities and outputs. A principal investigator, based at the International Centre for Agricultural Research in the Dry Areas (ICARDA), will provide research coordination with the co-investigators based at ILRI in Nairobi, Kenya.

10. Three programme nodes have been identified: Middle East (Mashreq), North Africa (Maghreb) and Horn of Africa. In the Mashreq project node, the focus will be on household/community studies

ANNEX II

in the Badia region of Jordan and Syria, research into the diagnosis of small-ruminant disease and the development of control strategies in Jordan and Syria, and national/regional livestock marketing studies in the region (Iraq, Jordan, Lebanon, Syria and Turkey) linked to importing countries (Saudi Arabia, Gulf States).

11. A second node of the programme will be based in The Sudan, which in fact will be the focus of research activities for the Horn of Africa (Djibouti, Somalia and The Sudan) with a view to expanding activities to other countries in this cluster.

12. The third node will be based at the ICARDA office in Tunisia and will be staffed by a research fellow backstopped by the ICARDA regional scientist in Tunisia, the programme epidemiologist, and ILRI scientists.

13. Training workshops and technical support from ILRI staff and short-term consultants will strengthen capacity in database management, GIS, epidemiology, marketing, socio-economics, laboratory diagnosis and livestock policy relevant to the region.

14. ILRI, in collaboration with NARS, national veterinary services and ICARDA, will implement the programme. A steering committee representing each of the participating countries (and non-governmental organizations in the RADISCON project as appropriate), the Arab Fund for Economic and Social Development (AFESD), FAO, ICARDA, IFAD, ILRI and the Islamic Development Bank (IsDB) will supervise and oversee the programme's legal, technical and organizational needs.

VI. INDICATIVE PROGRAMME COSTS AND FINANCING

15. The total costs over the five-year period will be USD 4.2 million. IFAD will contribute USD 1.1 million. IsDB has pledged USD 1.0 million mainly to support capital equipment and training requirements. AFESD has been requested to contribute USD 1.2 million to finance salaries, research expenses, travel, workshops and programme coordination. FAO, ICARDA, ILRI and NARS will contribute the remaining USD 900 000.

FINANCING PLAN FOR THREE-YEAR PROGRAMME (USD '000)

Funding Source Description	IFAD	IsDB	AFESD	ILRI	ICARDA	FAO	NARS	Total
Personnel								
Scientific staff	240	-	240	216	72	72	200	1 040
Support staff	20	-	20	10	5	5	100	160
Capacity-Building and Training								
Consultants	65	200	95	-	-	-	-	360
Training fellows	120	120	120	-	-	-	-	360
Workshops	90	-	90	-	-	-	-	180
Travel								
Programme travel	60	-	60	-	-	-	-	120
Equipment and supplies	150	530	170	-	-	-	200	1 050
Research Field Expenses								
Field costs	170	-	200	-	-	-	20	390
Administrative Backstopping								
ICARDA/FAO coordination	25	-	25	-	-	-	-	50
ILRI administration	160	150	180	-	-	-	-	490
Total	1 100	1 000	1 200	226	77	77	520	4 200